Remarks/Arguments

Claims 1, 8, 9, 23, 27, 29-31, 58, 60, 71 and 72 have been amended. Claims 73-83 have been withdrawn. Claims 84-95 have been added. Claims 1-72 and 84-95 are in the application. Reexamination and reconsideration of the present application are respectfully requested in light of the above-indicated amendments and the following remarks.

Claim 1 has been amended to specify that the catalyst comprises Co supported on a support, the Co loading being at least about 25% by weight. Support for this amendment can be found in the Applicants' specification at page 18, lines 1-5.

Claims 8 and 9 have been recast in independent form by merging each of the claims with the original claim 1. The Examiner's attention is directed to the Written Opinion that was issued for International Application No. PCT/US2004/042065 by the International Searching Authority on June 29, 2005 and submitted with the Applicants' Information Disclosure Statement filed August 29, 2005. In this Written Opinion, the International Searching Authority concluded that original claims 8 and 9 were considered to be both novel and involving an inventive step. New claims 84-89 depend from claim 8. New claims 90-95 depend from claim 9. It would be consistent with the finding of the International Searching Authority for the Examiner to conclude that claims 8 and 9, as amended herein, are non-obvious and therefore patentable. A finding that claims 8, 9 and 84-95 are patentable is believed to be warranted and is respectfully requested.

Claims 23, 27 and 29-31 have been amended to conform the language in these claims to the language used in the amended claim 1.

Claims 58 and 60 have been amended by correcting typographical errors. Claims 58 and 60 as originally submitted specified a conversion of Co. It was intended to specify in these claims a conversion of CO. The amendments to claims 58 and 60 are provided for correcting these typographical errors.

Claims 71 has been amended to specify that the catalyst comprises Co supported on alumina, the Co loading being at least about 25% by weight. Support for this amendment can be found in the Applicants' specification at page 18, lines 29-30.

Claim 72 has been amended to specify that the Co loading is at least about 28%. Support for this amendment can be found in the Applicants' specification at page 18, lines 29-31. Claim 72 has also been amended to specify that the conversion of CO is about 40% or higher per cycle. Support for this amendment can be found in the Applicants' specification at page 28, line 14.

Claims 1-7 and 10-72 now specify the use of a catalyst comprising Co supported on a support, the Co loading being at least about 25% by weight. The use of this catalyst provides the advantage of forming an aliphatic hydrocarbon having at least about 5 carbon atoms at a rate of at least about 0.5 gram of hydrocarbon per gram of catalyst per hour. This is not disclosed or suggested in either of the references cited by the Examiner.

Claims 1-72 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. 2003/0219903 A1 to Wang et al. (hereinafter Wang '903) in view of U.S. Patent 6,558,634 B1 to Wang et al. (hereinafter Wang '634). The Examiner should note that in the office action on page 2, Wang '903 was incorrectly identified as "U.S. P.N. 2203/0129903."

Claims 8 and 9 are believed to be patentable for the reasons indicated above and are therefore not further discussed below. The rejection is respectfully traversed.

Wang '903 discloses microchannel reactors having varying cross-sections for conducting various chemical reactions. The cross-section in these microchannel reactors increase or decrease along their flow path. This has the effect of increasing or decreasing the linear velocity along the flow path and thus increasing or decreasing the local contact time between the reactants and the catalyst. A large number of reactions that can be conducted in this reactor are disclosed in paragraph 0053 of the reference. Among these reactions are Fischer-Tropsch reactions. The examples disclosed in paragraphs 0056-0065 relate to Fischer-Tropsch synthesis reactions. The catalyst used in these examples contains 20 weight % cobalt, 1.3% by weight ruthenium and 3% by weight lanthanum supported on alumina. The reference does not disclose or suggest use of a Co catalyst with a Co loading of at least about 25% by weight as specified in Applicants' claims 1 and 71 or at least about 28% as specified in claim 72. The examples refer to achieving a conversion of 70% of the CO but do not specifically disclose obtaining an aliphatic hydrocarbon product having at least about 5 carbon atoms. The examples do not disclose or suggest producing an aliphatic hydrocarbon product having at least about 5 carbon atoms at a rate of about 0.5 gram of aliphatic hydrocarbon per gram of catalyst per hour as specified in claims 1, 71 and 72. Applicants respectfully submit that Wang '903 does not disclose or suggest the invention specified in the Applicants' claims 1-7 and 10-72.

The Examiner admits that Wang '903 is silent about the rate of hydrocarbon product produced per gram of catalyst per hour as specified in the Applicants' claims 1, 71 and 72.

The Examiner then states that it is within the purview of one of ordinary skill in the art to maximize productivity based on the total grams of solid catalyst when methane selectivity is minimized using microchannel reactors. While this may be a desired result, at least as determined by the Applicants, this desired result is not disclosed or suggested in Wang '903. Moreover, the Applicants' claims 1, 71 and 72 specify obtaining this result using a catalyst comprising Co wherein the Co loading is at least about 25% by weight (28% in claim 72) which is not disclosed or suggested in Wang '903.

Wang '634 is cited for its disclosure of a Fischer-Tropsch process carried out adjacent to a microchannel heat exchanger using a Co containing catalyst supported on alumina. Referring to Fig. 2 in the reference, the catalyst disclosed in this reference has a porous support 100, an optional buffer layer 102 overlying the porous support, an interfacial layer 104 overlying the buffer layer, and a catalyst layer 106 overlying the interfacial layer. This reference does not disclose a catalyst comprising Co supported on a support wherein the Co loading is at least about 25% by weight as specified in claims 1 and 71 or at least about 28% as specified in claim 72. Although the reference refers to obtaining "a production rate of at least 1 milliliter per minute of liquid product" (column 4, lines 5-6), it does not specifically disclose a process for producing at least about 0.5 gram of aliphatic hydrocarbon having at least about 5 carbon atoms per gram of catalyst per hour as specified in the Applicants' claims 1, 71 and 72.

Neither Wang '903 nor Wang '634 disclose the use of a Co containing catalyst wherein the Co loading is at least about 25% as specified in claims 1 and 71 or at least about 28% by weight as specified in claim 72. Neither reference discloses the use of such

a catalyst for producing at least about 0.5 gram of aliphatic hydrocarbon having at least about 5 carbon atoms per gram of catalyst per hour as specified in claims 1, 71 and 72. Neither reference provides the required motivation for using a Co containing catalyst as claimed for obtaining aliphatic hydrocarbon compounds of at least about 5 carbon atoms at the rate specified in the claims to support the rejection. Dependent claims 2-7 and 10-70 are further distinguishable from Wang '903 and Wang '634 for additional reasons. Applicants respectfully submit that the Examiner has failed to establish a prima facie case of obviousness against claims 1-7 and 10-72. Withdrawal of the rejection is believed to be warranted and is respectfully requested.

The office action included copies of Form PTO 1449 as previously submitted by the Applicants wherein the references of Ouwang et al., Wegeng et al. and Matlosz et al. were crossed out and the notation "date unknown" was written in next to the cross out. Attached to this response is a new From 1449 wherein these references are again identified. Also, for the Examiner's convenience, copies of the references are enclosed. Matlosz et al. shows copyright dates of both 2001 and 2002. The Applicants do not know when Ouyang et al. or Wegeng et al. were published. However, for purposes of this particular response, Applicants are willing to admit that these references are prior art with respect to the subject application in order to have the references considered and made of record. Applicants hereby reserve the right to challenge the prior art status of these reference should the issue arise in a later proceeding.

Applicants respectfully submit that claims 1-72, as amended herein, as well as claims 84-95, are in condition for allowance. A Notice of Allowance is respectfully requested.

Any additional fees required for the filing of this response can be charged to Deposit Account No. 18-0988.

If there are any issues the Examiner would like to discuss with the Applicants' attorney, he is invited to contact the undersigned by phone.

Respectfully submitted,

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